

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of all claims in the application.

### Listing of Claims

#### Claims 1-98 (Canceled)

99. (New) An enzyme solution comprising an anti-freeze protein and an enzyme; wherein said enzyme retains enzymatic activity after at least one freeze/thaw event.
100. (New) The enzyme solution according to Claim 99, wherein said enzyme retains activity after more than ten freeze/thaw events.
101. (New) The enzyme solution according to Claim 99, further comprising a buffer.
102. (New) The enzyme solution according to Claim 101, wherein said buffer is zwitterionic.
103. (New) The enzyme solution according to Claim 99, further comprising a carrier protein.
104. (New) The enzyme solution according to Claim 103, wherein said carrier protein is bovine serum albumin (BSA).
105. (New) The enzyme solution according to Claim 99, wherein said anti-freeze protein comprises an alanine-rich motif.
106. (New) The enzyme solution according to Claim 99, wherein said anti-freeze protein is an AFP Type I protein.
107. (New) The enzyme solution according to Claim 101, wherein said enzyme solution has a pH from about 7.9 to about 8.9.
108. (New) The enzyme solution according to Claim 99, further comprising a polyol.
109. (New) The enzyme solution according to Claim 108, wherein said polyol is selected from the group consisting of sorbitol and trehalose.
110. (New) The enzyme solution according to Claim 108, wherein said polyol comprises sorbitol and trehalose.

111. (New) The enzyme solution according to Claim 99, wherein said anti-freeze protein has a concentration of from about 10ug/ml to about 200 ug/ml.
112. (New) The enzyme solution according Claim 99, wherein said enzyme is a DNA polymerase and the addition of said enzyme solution to an amplification reaction mixture improves the sensitivity and yield of the nucleic acid amplification reaction.
113. (New) A reaction mixture for use in a nucleic acid amplification reaction, comprising dNTPs and an enzyme solution according to Claim 112.
114. (New) A method for enhancing the stability of an enzyme over the course of two or more freeze/thaw events, comprising the addition of an anti-freeze protein to an enzyme solution containing said enzyme prior to said freeze thaw events.
115. (New) A method for increasing the sensitivity and yield of a nucleic acid amplification reaction, comprising combining a target nucleic acid sequence with at least one primer in a reaction mixture according to Claim 113 and amplifying said target nucleic acid sequence, wherein the inclusion of said anti-freeze protein increases amplicon yield and sensitivity.
116. (New) An improved method for detecting a target nucleic acid sequence in a sample, comprising combining said sample with at least one primer in a reaction mixture according to Claim 113 and amplifying said target nucleic acid sequence; wherein the inclusion of said anti-freeze protein increases signal intensity and improves the signal-to-noise ratio.
117. (New) An improved method for quantifying a target nucleic acid sequence in a sample, comprising combining said sample with at least one primer in a reaction mixture according to Claim 113 and amplifying said target nucleic acid sequence; wherein the inclusion of said anti-freeze protein increases signal intensity and improves the signal-to-noise ratio.
118. (New) A kit comprising: a solution comprising an anti-freeze protein and an enzyme.
119. (New) The kit of Claim 117 wherein the solution further comprises a carrier protein.